

CLAIMS

[cl001] 1. A curing light comprising:

- a housing for housing components of a curing light,
- air space within said housing,
- at least one vent located on said housing,
- a secondary heat sink located within said housing, said heat sink having a proximal and a distal side,
- a thermoelectric cooler to assist in heat dissipation located on said secondary heat sink proximal side,
- a fan located within said housing, said fan being capable of causing air to move past said thermoelectric cooler in order to improve heat dissipation,
- a plurality of light emitting semiconductor modules located on said heat sink distal side, each of said semiconductor modules including
 - a primary heat sink,
 - a semiconductor chip which emits light of a wavelength useful for curing light curable composite materials, said chip being affixed to said primary heat sink,
 - a cover serving to protect said chip,
 - a light reflective device which collects light emitted by said semiconductor modules and focuses it into a light beam,
 - a focusing lens which serves to focus said light beam from said light reflective device onto a light transport device, and
 - a light transport device.

[cl002] 2. A curing light as recited in claim 1 wherein said light transport device is selected from the group consisting of a plastic stack, a fiber bundle and a light guide.

[cl003] 3. A curing light as recited in claim 1 wherein said semiconductor chip is selected from the group consisting of light emitting diode chips, laser chips, light emitting diode chip array, diode laser chips, diode laser chip arrays, surface emitting laser chips, edge emitting laser chips, and VCSEL chips.

[cl004] 4. A curing light as recited in claim 1 wherein said light reflective device has a light reflective interior surface.

[cl005] 5. A curing light as recited in claim 4 wherein said light reflective interior surface includes a material selected from the group consisting of Al, Au, Ag, Zn, Cu, Pt, chrome, other metals, plating, and plastic.

[cl006] 6. A curing light comprising:
a housing for housing components of a curing light,
a heat sink located within said housing, said heat sink having a proximal and a distal side,
a thermoelectric cooler to assist in heat dissipation located on said secondary heat sink proximal side,
a fan located within said housing, said fan being capable of causing air to move past said thermoelectric cooler in order to improve heat dissipation,
at least one semiconductor chip which can emit light of a wavelength useful for curing light curable composite materials,
said heat sink and said thermoelectric cooler serving to dissipate heat produced by said chip,
a light reflective device which collects light emitted by said chip and focuses it into a light beam,
a focusing lens which serves to focus said light beam from said light reflective device onto a light transport device, and
a light transport device.

[cl007] 7. A curing light as recited in claim 6 wherein said light transport device is selected from the group consisting of a plastic stack, a fiber bundle and a light guide.

[cl008] 8. A curing light as recited in claim 6 wherein said semiconductor chip is selected from the group consisting of light emitting diode chips, laser chips, light

emitting diode chip array, diode laser chips, diode laser chip arrays, surface emitting laser chips, edge emitting laser chips, and VCSEL chips.

[cl009] 9. A curing light as recited in claim 6 wherein said light reflective device has a light reflective interior surface.

[cl010] 10. A curing light as recited in claim 9 wherein said light reflective interior surface includes a material selected from the group consisting of Al, Au, Ag, Zn, Cu, Pt, chrome, other metals, plating, and plastic.

[cl011] 11. A curing light comprising:
a housing for housing components of a curing light,
a heat sink located within said housing, said heat sink having a proximal and a distal side,
at least one semiconductor chip which can emit light of a wavelength useful for curing light curable composite materials,
said heat sink serving to dissipate heat produced by said chip,
a light reflective device which collects light emitted by said chip and focuses it into a light beam,
a focusing lens which serves to focus said light beam from said light reflective device onto a light transport device, and
a light transport device.

[cl012] 12. A curing light as recited in claim 11 wherein said light transport device is selected from the group consisting of a plastic stack, a fiber bundle and a light guide.

[cl013] 13. A curing light as recited in claim 11 wherein said semiconductor chip is selected from the group consisting of light emitting diode chips, laser chips, light emitting diode chip array, diode laser chips, diode laser chip arrays, surface emitting laser chips, edge emitting laser chips, and VCSEL chips.

[cl014] 14. A curing light as recited in claim 11 wherein said light reflective device has a light reflective interior surface.

[cl015] 15. A curing light as recited in claim 14 wherein said light reflective interior surface includes a material selected from the group consisting of Al, Au, Ag, Zn, Cu, Pt, chrome, other metals, plating, and plastic.

[cl016] 16. A curing light comprising:
a housing for housing components of a curing light,
a heat sink located within said housing, said heat sink having a proximal and a distal side,
at least one semiconductor chip which can emit light of a wavelength useful for curing light curable composite materials,
said heat sink serving to dissipate heat produced by said chip,
a light reflective device which collects light emitted by said chip and focuses it into a light beam, and
a focusing lens which serves to focus said light beam from said light reflective device onto a light transport device.

[cl017] 17. A curing light as recited in claim 16 wherein said light transport device is selected from the group consisting of a plastic stack, a fiber bundle and a light guide.

[cl018] 18. A curing light as recited in claim 16 wherein said semiconductor chip is selected from the group consisting of light emitting diode chips, laser chips, light emitting diode chip array, diode laser chips, diode laser chip arrays, surface emitting laser chips, edge emitting laser chips, and VCSEL chips.

[cl019] 19. A curing light as recited in claim 16 wherein said light reflective device has a light reflective interior surface.

[cl020] 20. A curing light as recited in claim 19 wherein said light reflective interior surface includes a material selected from the group consisting of Al, Au, Ag, Zn, Cu, Pt, chrome, other metals, plating, and plastic.